

**MECHATRONICS BOOK SERIES**  
**SELECTED PAPERS FROM**  
**ICOM'01, ICOM'05 AND**  
**ICOM'08**

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## **INTELLIGENT GENERATOR FOR SEMI-ACTUAL TEST DATA**

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### **ABSTRACT**

The actual test data generation is one of the difficult and expensive parts of applying software-testing techniques. Many of the current test data generators suffers from the reduction of user's confidence in generated test data and testing process. This is because of focusing on developer and database administrator viewpoints regardless of users concerns and focusing on data type and structure regardless of meaning. This paper proposes a model of an intelligent generator for semi-actual test data with the aim of increasing the users confidence in software testing. The model uses samples of real data as a resource data and set of efficient generation techniques based on statistical methods such as permutations, combination, sampling, and statistical distributions. The selection of the suitable structure and generation technique is based on one of the intelligent soft computing techniques such as fuzzy logic, neural network, heuristic, or genetic algorithm. The generated test data is validated according to the data specifications then tested by one of the normality testing techniques to be close to the real world or environment of the testing processes. This model offers the ability of simulating the real environments.

**Keywords :** Software Testing, Test Data Generation, Semi-Actual Data, Intelligent Generator, Simulation.

### **1. INTRODUCTION**

During 1990's, the primary challenge and goal of software engineering becomes the production of quality software and the reduction of the cost of the computer-based solutions that are implemented with software [1, 2]. To improve software quality: Software testing is used as one of the essential tools. It is one of the complicated problems in software development life cycle, which is expensive (40-50% of the total software development cost) and labor intensive [3, 4]. Software is now being applied in critical situations such as control valuable machinery, handles money, and safeguards human lives. The failure in such situations can be disastrous; therefore there is a need for efficient software testing to reduce the risk of using software [5, 6]. Software testing requires set(s) of test data. The automation and improving of test data generation will reduce the cost of the software development and testing. Unfortunately, the automatic test data generation still facing many problems, which need more effort to solve. These problems can be summarize as: